SMALL BUSINESS INNOVATION RESEARCH PROGRAM

HEARING

BEFORE THE

SUBCOMMITTEE ON PROCUREMENT, TOURISM, AND RURAL DEVELOPMENT

OF THE

COMMITTEE ON SMALL BUSINESS HOUSE OF REPRESENTATIVES

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

WASHINGTON, DC, OCTOBER 17, 1990

Printed for the use of the Committee on Small Business

Serial No. 101-83

U.S. GOVERNMENT PRINTING OFFICE

35-267 WASHINGTON : 1991

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

H721-25

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CONTENTS

Page

Hearing held on October 17, 1990 1

WITNESSES

WEDNESDAY, OCTOBER 17, 1990

Shane, Richard, Assistant Administrator, Office of Innovation, Research and Technology, U.S. Small Business Administration, accompanied by Jack Sweeney, Deputy Assistant Administrator 4

APPENDIX

Opening statements:
- Conte, Hon. Silvio, with letters 19
  - Charles Evans & Associates, Richard J. Blattner, vice president and chief financial officer 20
  - Modell Development Corporation, Michael Modell, president 28
  - Technology Systems Inc., Charles Benton, president 25
- Machtley, Hon. Ronald K. 30
- Skelton, Hon. Ike, with attachments 13
  - Selected multiple award winners from fiscal year 1986 to fiscal year 1989 18
  - Top recipients of SBIR awards in 1989 16

Shane, Richard:
- Letter to Chairman Skelton 51
- Prepared statement 33

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

WEDNESDAY, OCTOBER 17, 1990

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON PROCUREMENT,
TOURISM, AND RURAL DEVELOPMENT,
COMMITTEE ON SMALL BUSINESS,
Washington, DC.

The subcommittee met, pursuant to notice, at 1:02 p.m., in room 2359-A, Rayburn House Office Building, Hon. Ike Skelton (chairman of the subcommittee) presiding.

Chairman SKELTON. Ladies and gentlemen, our hearing will come to order. I apologize for being 2 minutes late. We like to start on time.

Today, the Small Business Subcommittee on Procurement is conducting an oversight hearing on the Small Business Innovation Research Program, commonly known as SBIR. In the process, we also wish to examine the operation of the Small Business Administration's Office of Innovation, Research and Technology, the office responsible for implementing and monitoring the SBIR Program.

Representing the Small Business Administration we are pleased to have with us Mr. Richard Shane, Assistant Administrator of the SBA's Office of Innovation, Research and Technology. Accompanying Mr. Shane is Deputy Administrator Jack Sweeney. I would like to thank both of them for their assistance to our subcommittee.

Established by the Small Business Innovation Development Act of 1982 [Pub. L. 97-219], which I was pleased to cosponsor at the time, the SBIR Program requires all agencies with yearly external research obligations of more than $100 million to solicit research proposals from small businesses and provide funds for qualified projects. Participating agencies must set aside at least 1.25 percent from research and development budgets for the SBIR Program. Of course, this is a floor. I am pleased that some agencies exceed those levels and work very hard to solicit, review, and select outstanding projects. In another life I'm also a member of the Armed Services Committee, and I'm delighted to see the Department of Defense lead the way in this program. If my recollection is correct, the DOD's total small business research commitment is in excess of 3 percent.

The goals of the program were set by Congress as follows: To stimulate technological innovation; to use small businesses to meet Federal research and development needs; to foster and encourage participation by minority and disadvantaged persons in technologi-

cal innovation; and to increase private sector commercialization innovations derived from Federal research and development. Though there was some resistance to the act from agencies, the program received widespread support. It was recommended by the President's Commission on Innovation. It was recommended by the first White House Conference on Small Business, and, finally, it was cosponsored by 90 Senators and over 200 Members of the House.

The SBIR Program was enthusiastically received when it was first implemented back in 1983. The program has earned so much support from the small business community that delegates at the Second White House Conference on Small Business convinced the Congress to take a look at early reauthorization of the program. We reauthorized this in 1986, which was 2 years before the program was originally set to expire.

Some of the reasons for the popularity of the program are obvious. Small businesses, especially small, high-technology businesses, have been shown to be cost-effective performers of research and development. I believe that studies in 1970 showed small businesses to be 24 times more productive than large businesses with the R&D dollar and four times more productive than medium-sized businesses. Small businesses without access to sufficient funds for independent research and development have certainly been helped through the SBIR Program because they have a chance to prove themselves and flesh out their research.

But a further goal of the program, and one that is latched on to by legislators, is that the program should increase the commercialization of Federal research and development. Research comes out of the Federal bureaucracy and is developed and applied by the private sector. This definitely gives us a bigger bang for our Federal research buck, and small, innovative companies benefit in the marketplace by applying this research. The country benefits because Federal research is finally put to use. It is our ability to apply what we have learned that will be the mark of a successful effort to compete in the fast-paced world markets.

But it is not our intent for this hearing to be simply a recapitulation of the successes of the SBIR Program. Our witnesses have come to report to Congress of their progress with this program and to bring us up-to-date on the status and preliminary findings of their research and recordkeeping with regard to the program. Is the SBIR Program meeting the goals set out by Congress?

There are some aspects of the SBIR Program which raise some concern. For one thing, the high concentration of awards geographically leads to the suggestion that more should be done to teach other parts of the country how to apply for awards as successfully.

More importantly, I have questions about the growing number of companies which seem to have made a full-time enterprise out of winning multiple SBIR awards. I am including in the record a list of the top 20 award winners for 1989. I would ask that this list at this time be placed in the record, without objection.

[The information may be found in the appendix with Chairman Skelton's opening statement.]

Chairman SKELTON. Amazingly, these 20 companies account for fully 11 percent of all awards during that period. When you consid-

er the SBA has 70,000 names of small businesses interested in the SBIR Program, and 19,000 proposals were received in 1989, this top-heavy tendency merits further discussion. Are we channeling Federal research and development money to the most promising scientific researchers, or to the most talented application drafters?

Further, we need to reflect on whether Congress intended a program where individual companies can win 20, 30, or even 40 awards each year, and 50, 100, or 150 awards over 4 years. How are we really doing in phase III—I think that's the most important phase—the commercialization component of the program? Conceivably, if a small business is winning a good number of awards and proceeding to successful commercialization of their innovations, this small business could quickly become a big business. Congressional intent did not sanction the creation of SBIR award factories in the small business community. We want to make sure that a growing number of small businesses benefit from entry into the area of technological innovation.

In addition, proposals have been made over the years to change the program. For example, how early does the Congress need to reauthorize the program in order to avoid disruption of SBIR at the agency level? Other proposals to reform the program that we want to look at include suggestions to increase agency SBIR set-aside percentages, to make the program permanent, to authorize funds for SBIR administration costs, and to lower the research and development budget threshold to increase the number of participating agencies.

With our hearing today, we start our consideration of all these issues. Over the next year, this subcommittee intends to talk to a representative group of participants, program managers, and aspirants in anticipation of the reports on the program by GAO and SBA at the end of next year. We should be able to build a solid case for reauthorization of this program on the foundation that these hearings will provide.

[Chairman Skelton's statement, with attachment, may be found in the appendix.]

We look forward to Mr. Shane's remarks on the program, on the SBA's annual SBIR report, and his preliminary statement on the commercialization report being prepared by the Office of Innovation, Research and Technology.

Mr. Rhodes, do you have a statement?

Mr. RHODES. No; thank you, Mr. Chairman.

Chairman SKELTON. Without objection, the statement of Mr. Silvio Conte, with letters attached thereto, and Mr. Machtley's statement will be placed in the record.

[Mr. Conte's statement and letters and Mr. Machtley statement may be found in the appendix.]

Chairman SKELTON. Mr. Shane, it's all yours.

TESTIMONY OF RICHARD SHANE, ASSISTANT ADMINISTRATOR, OFFICE OF INNOVATION, RESEARCH AND TECHNOLOGY, U.S. SMALL BUSINESS ADMINISTRATION, ACCOMPANIED BY JACK SWEENEY, DEPUTY ASSISTANT ADMINISTRATOR

Mr. SHANE. Thank you, sir. Mr. Chairman, could I, in the interest of time, present a short statement and have my full statement put in the record?

Chairman SKELTON. That would please everyone.

Mr. SHANE. Thank you. Mr. Chairman and members of the subcommittee, it is my pleasure today to testify before you concerning the Small Business Innovation Research Program. As you said, I am accompanied today by Mr. Jack Sweeney, our Deputy Assistant Administrator of the Office of Innovation, Research and Technology.

The Small Business Innovation Research Program, commonly known as SBIR, continues to show solid evidence that it is fulfilling its central objectives, and that is to spur the development of new products and processes by small high-technology enterprises and then to bring an increasing number of those new products and processes to the commercial marketplace, and in the process, foster and encourage technical innovation by minority and disadvantaged persons.

The SBIR Program began in fiscal year 1983. In its 7 years, SBIR can list these highlights and accomplishments:

In response to over 90 solicitations, the 11 Federal agencies participating in the program have received in excess of 95,800 proposals from small, high-technology firms. This has resulted in approximately 14,900 competitive awards worth more than $1.8 billion. Of this amount, I am pleased to say that 11.2 percent of these awards went to minority firms.

In fiscal year 1989, 2,886 awards were made, worth approximately $432 million.

More than 70,000 names and addresses of small firms and interested parties have been recorded on SBIR's fully automated outreach system mailing list, and thus receive current information on SBIR Programs and policies and useful information on agency solicitation for proposals.

More importantly, an increasing number of small, high-technology companies receiving SBIR awards are achieving commercial sales success. These successes have come in a wide range of technologies, everything from medical science, fisheries, and solid waste management, to aerospace, computers, electronics, and life science. Our ongoing SBIR commercialization study, in preliminary findings, shows that about one in four small high-technology firms receiving SBIR awards have achieved commercial sales success, or has good reason to expect that commercialization will be realized in the near future.

Thus, the SBIR Program is turning research and development results into new products and processes which help keep America competitive and benefit virtually all of our citizens, and even people abroad.

Mr. Chairman, the Small Business Innovation Research Program has been the subject of more review and audit than any R&D pro-

gram in the Federal Government. Since program inception in fiscal year 1983, we have had six General Accounting Office audits and reports, and another has just begun. The Office of Science and Technology Policy has issued six reports, and our Office of Innovation, Research and Technology has provided Congress with seven detailed annual reports. In addition, the SBA is conducting an SBIR commercialization study during this time.

Surveys done by us over the last 3 years show that the SBIR Program is well on the way to fulfilling its basic objective: To turn research and development by SBIR awardees into commercial success. These firms operate in a wide variety of industries and are outstanding examples of how SBIR funding significantly helped in the firms' R&D and in the firms' efforts to bring their products and services to the commercial market.

The SBA surveys indicate that one in four firms report successful commercial marketing 4 years after completion of phase II. Even after only 2 years, since completing phase II, 13 percent of the firms surveyed reported successful commercialization. This figure rose to 22 percent among firms surveyed 3 years after completion of phase II, and then to the 25 percent figure after 4 years.

SBA has now surveyed more than 800 phase II projects. In the first year of the surveys, SBA attempted to contact all phase II awardees who had won phase I awards in the first full year of the program—fiscal year 1983. This contact resulted in 353 firms being surveyed, a 90-percent response rate. In the following 2 years, samples of 240 projects, representing about half of all phase II awards for that period, were surveyed.

The amount of commercialization varies, we have found, with each individual agency. Using survey results among firms reporting commercialization success 3 years after completion of the phase II research and development, the Department of Health and Human Services shows the greatest commercialization success rate by far, approximately 36 percent. Figures for other agencies are the National Science Foundation, 20 percent; Department of Energy, 19 percent; NASA, 19 percent; and the Department of Defense, 13 percent. The other agencies did not have enough phase II projects to produce meaningful statistics. It is our intent at the SBA to publish our findings and analyses during calendar year 1991.

As noted before, the General Accounting Office has just begun their latest legislated audit which is due to Congress in December 1991. Upon the completion and publication of both of these documents, the SBA will be in a position to make recommendations concerning any proposed changes to the law during reauthorization hearings.

Based upon our experience and the data collected and reviewed to date, we are very optimistic as to the program's accomplishments and potential. The participating agencies and small, high-technology businesses deserve a great amount of credit for the current success of the SBIR Program. I am confident the two forthcoming reports will provide us with positive information that we anticipate upon completion of the review of the program.

Mr. Chairman, this concludes my opening remarks. I would be pleased to answer any questions you may have.

[Mr. Shane's statement may be found in the appendix.]

Chairman SKELTON. Let me ask you about the top recipients of SBIR awards in 1989. We have the top 20 listed. A number of them are from Massachusetts, several from California. The only thing that's not on the east or west coast is one from Minnesota that received 13 awards. I am concerned about these being concentrated in certain States and certain sections of our country. I haven't been able to isolate why some of these areas are so successful and others are not. What is the reason for that, Mr. Shane?

Mr. SHANE. Mr. Chairman, we shared your concern early in the program, and over a span of 5 years we performed a study within the SBA laying out every award winner by State and by county within the State. We also, as part of this study, collected information from the IRS, the Department of Labor, and numerous other sources.

What we found essentially were several things. One, like everything else in the country, there is an unequal distribution of scientific people within the country. They have attended college in California and they've had the advantage of that because that was the birthplace of aircraft and on to the aerospace industry and then on to the computer industry. In the same regard, there's an unequal distribution by the natural course of things, of farming, mining, lumbering, and various other industries. So, this unequal distribution will continue to maintain itself.

In that regard, we have spent a considerable amount of time over the last several years trying to put our outreach efforts into the areas of the country which have had less winners than other States. We have yet to turn down any request to speak, appear at, or supply information to any lesser State, county area, or city. We have attended approximately 35 of these in the last 2 years. But by natural course of distribution, there will be an unevenness.

Chairman SKELTON. We think we have some smart people out in Missouri, too, as well as other parts of the Midwest. We have colleges, universities, people who have innovative ideas. It baffles me.

I wonder if we're not getting into a situation—and I'll lead to that in a minute—a situation where we have experts in the area of filing applications. Those of us who represent small towns and rural America realize that communities that are small and make applications for Federal grants have a difficult time getting the applications in top-flight form, but the Kansas Cities and the St. Louises in this world have a whole floor full of people filling out these applications, and they get it done right.

In looking at the multiple award winners from 1986 to 1989, five are from Massachusetts and four are from California. That bothers me.

Mr. SHANE. Let me, if I might, bring your attention to page 29 of our annual report——

Chairman SKELTON. Should we have a provision in the law making sure that these are equally distributed throughout America?

Mr. SHANE. Mr. Chairman, I don't think it would really be possible from a technical sense. Let me raise a point, if I might.

Chairman SKELTON. If we pass a law, it will be.

Mr. SHANE. It sure will. Let me raise a point, if I might. In trying to understand the geographic spread of awards, we made a computer study by metropolitan area, by population. If you look at the population area of award winners, you will find that Huntsville, Alabama and Santa Fe, New Mexico are one and two. Boston does come in at number three, but then it goes to Albuquerque, New Mexico, Roanoke, Virginia, Las Cruces, New Mexico. It definitely does have——

Chairman SKELTON. That's based upon population or per capita, is that correct?

Mr. SHANE. That's correct. It's on a per capita basis.

Chairman SKELTON. For the record, Mr. Shane—I'm familiar with it—but for the record, please explain phase I, phase II, and phase III, in 25 words or less.

Mr. SHANE. Twenty-five words or less. Phase I is to develop analytically the initial idea.

Chairman SKELTON. An original grant goes for that?

Mr. SHANE. An original award, and up to 6 months and up to $50,000.

Chairman SKELTON. Right.

Mr. SHANE. Phase II is to develop the prototype up to 2 years, up to $500,000.

Chairman SKELTON. Phase III?

Mr. SHANE. Phase III means no more SBIR funds. If the agency has a continuing interest, they may procure it under their normal procurement methods. It is also a commercialization phase for the company.

Chairman SKELTON. So, in essence, companies either commercialize privately or through sales to the agency that made the awards in the first place; is that correct?

Mr. SHANE. In those terms; yes.

Chairman SKELTON. I notice that—and this bothers me, particularly being on the Armed Services Committee—when we speak of commercialization, we have phase I and phase II award winners done through the Department of the Army, just to use them as an example. But only 13 percent under the phase II award winners go on to phase III.

Mr. SHANE. That's correct.

Chairman SKELTON. That really concerns me. It seems like we're putting a lot of money down a rat hole if only 13 percent of Department of Defense move on to do something about it.

Mr. SHANE. We have looked at that. In the Department of Defense, the SBIR technical topics are more applied research oriented and more specific to individual problems they have on systems. Many of those systems do not carry over any use to the commercial marketplace as opposed to, say, NIH, where everything has the potential of entering the medical market.

Chairman SKELTON. But phase III would be commercialization which also includes the Army, or Navy, or another participating Government agency buying it, doesn't it? Isn't that correct?

Mr. SHANE. If they so choose, yes.

Chairman SKELTON. That's right. But we only have 13 percent going commercial from the Army, even though the Army has gone beyond the initial interest phase and gone through phase II.

Mr. SHANE. A considerable amount of the work they have done, I agree with you, has to do with studies, which DOD tends to do a lot of.

Chairman SKELTON. I understand that.

Mr. SHANE. Yes; but I don't want to characterize it.

Chairman SKELTON. Should they be more selective in their phase II projects or not?

Mr. SHANE. We review most of the topics and discuss them with each one of the agencies. It's a continuing request we have, since the law did direct us to solve high-technology problems, that the topics fit as much in that category as possible.

Chairman SKELTON. Mr. Rhodes.

Mr. RHODES. No questions.

Chairman SKELTON. Mr. Hefley.

Mr. HEFLEY. I have no questions.

Chairman SKELTON. In your testimony, Mr. Shane, you mentioned that in 1989 you and your staff briefed 21 foreign governments.

Mr. SHANE. That's correct.

Chairman SKELTON. On our SBIR Program. I presume it is that foreign governments right now know a good thing when they see it. Would you tell us the results of that?

Mr. SHANE. On a country basis, England has started an SBIR Program, which is almost a direct copy of our current program. The European market has formed a version of it. We have briefed the French two or three times and advised them and given them a methodology on how they could start their own program. They are in the process of doing so now. We have had numerous visitors from South America looking at the program, with a new concept of economic development that's developing in South America. They have changed their methodology and are going with small units, small business, small development situations instead of large businesses.

Japan is particularly interested and has visited us more than any country.

Chairman SKELTON. I don't doubt that.

Mr. SHANE. They have usually spent as much as 2 weeks with us. Additionally, they have many group visits. Everybody else is for a few hours only.

Chairman SKELTON. I wonder if they would give us the same courtesy.

Mr. SHANE. They did provide me with a book they wrote on the program, but unfortunately it's in Japanese so I can't tell you what it says. They have studied the program very, very carefully. What we must assume from talking to them over and over again is that they will be starting a program.

Chairman SKELTON. Do you know if they license or produce any technology provided through this program?

Mr. SHANE. We have reported in internal Government, executive branch meetings, of our tracking of the program. The Japanese have shown a great interest in investing in SBIR firms who are working in the biomed field.

Chairman SKELTON. How many of those, in your recollection, go on to phase III, the Japanese-oriented firms?

Mr. SHANE. These particular firms are in the process of going into phase III commercialization or final development. The Japanese are highly selective and very concentrated, and they are now not into the area we traditionally think of as buying into the company. What they are doing is funding the final development or commercialization phase and sharing the knowledge, with the plan to move on to commercialization.

Chairman SKELTON. So, they recognize this for their own purposes, and would you say they're getting a windfall out of us?

Mr. SHANE. I think they're doing their homework very, very well.

Chairman SKELTON. Do you have any recommendations on keeping this benefit here at home rather than letting the Japanese benefit from it?

Mr. SHANE. The only way I could see it could be done, sir, would be to stimulate American venture capitalism, or get large businesses involved. One of the surprises we've had in the overall program is that in the last 2 years we have placed all of our technology award winning information through NTIS at the Department of Commerce, which has gone on a FEDRIP across the country for everybody to view and become interested in. We were surprised to find out from talking to the NTIS people that the largest users of the system tend to be small business, foreign governments, and large businesses last.

Chairman SKELTON. Let me ask two questions about the percentage of awards to SBIR recipients. I notice that the percentage award by the various agencies is literally all over the map, high and low.

Mr. SHANE. Yes.

Chairman SKELTON. Some agencies are reporting as high as 21 percent, and others are reporting zero.

Question one, I presume, is it the nature of the research that accounts for such disparities, or could you, for the record, give us an idea as to the cause for such low performance within some agencies?

Mr. SHANE. Actually, if I understand your question correctly, Mr. Chairman——

Chairman SKELTON. Some don't come to the ball game. Why is that?

Mr. SHANE. The mathematical effect, which I think we're discussing, is caused by the 1.25 percent. It's 1.25 percent of the agency's extramural budget. This causes an effect which we tend to call our big 5 and little 6. So you have five agencies who have a large extramural budget and you have six agencies who have a very small extramural budget. These being in the area of—the small are NRC, EPA, and the Departments of Transportation, Commerce, Education, and Agriculture. This gives them a very, very small window of programmatic opportunity. The Department of Defense is 55 percent of the program. We have three agencies who are less than 1 percent.

Chairman SKELTON. What enforcement mechanism do you use on agencies who fall short of the 1¼ percent requirement?

Mr. SHANE. We audit each one of them each year and publish our findings in SBA's annual report. We also have what we call a

plus-or-minus system. We notify each agency for the forthcoming fiscal year what they owe the program or what they're ahead on in program expenditures, over and above the 1¼ percent.

Chairman SKELTON. Should we have a higher requirement, possibly 2 percent or 3 percent, rather than 1¼ percent?

Mr. SHANE. I think, in the long term, as we head toward reauthorization, is something that's going to come up. There are many ways to look at it.

Chairman SKELTON. But do you have a recommendation?

Mr. SHANE. At this particular time, we would prefer to look to the smaller SBIR budget size agencies in order to bring them up to a higher level of award potential. I think it might be difficult for the larger agencies to increase their extramural amount and to keep high technical quality.

Chairman SKELTON. The Department of Defense is doing 3.3 percent; is that your testimony?

Yes, counsel.

Mr. ORBAN. In terms of the larger agencies, though, it seems that some of them, particularly the Department of Defense, which as you mentioned was 55 percent of the program, is already over 3.3 percent. So, I suppose what you would say is——

Mr. SHANE. I had them at 1¼ percent, unless—I'm referring to page 8.

Mr. ORBAN. I'm on page 12. Total phase I awards.

Mr. SHANE. Page 8 that I referred to is the SBIR awards. Page 12 is the overall R&D goaling program for the Federal Government. This is where DOD comes up to the 3 percent. But it bears no relationship to the SBIR awards.

Mr. ORBAN. OK.

Chairman SKELTON. Counsel, do you have another question?

Mr. ROWE. Thank you, Mr. Chairman. The chairman was asking you earlier whether we should have a higher floor. I wanted to bring up the fact that the GAO had thought that was a bad idea because there wasn't any hard evidence concerning the commercialization rate.

Now, in the current report here, you say your commercialization rate 4 years out is 25 percent.

Mr. SHANE. It would appear that's what it is at this time.

Mr. ROWE. Wouldn't that push you toward thinking that maybe in some areas the floor should be raised from 1.25 percent?

Mr. SHANE. As we move forward and solidify the data we have, we will have a clearer picture. We are still in analysis at this time, and one would tend to lean toward that direction. The question then becomes one of where would you raise and how would you raise. I think it's important that we don't overload some agencies while some are almost starving to death. I would see a much greater gain—interestingly enough, if one looks at the possibilities of these smaller SBIR budget agencies, these tend to be awarders in the lesser gaining States.

Mr. ROWE. Commercialization at DOD hasn't been as good as Health and Human Services. Is that really just due to the fact that Health and Human Services has a better overall commercial application?

Mr. SHANE. From the type of work they do. The mission and role of NIH is one to develop medical science for the country and turn it loose as fast as possible into the commercial market for the health of the Nation. The Department of Defense's mission and role, of course, is somewhat different. They have a lot of system problems and tend to look at things more in a systematic fashion and a lot of applied research to parts of their system that aren't working. So they are much more in the applied area.

Mr. ROWE. I'll stay on commercialization for a second, but switch over. You mentioned there's sort of a lack of venture capital which would be a good way to stop Japanese incursions into some of these areas. I thought the Commercialization Matching System was supposed to help the SBIR awardees find that sort of venture capital.

Mr. SHANE. It has to a great extent. But in our system, it is not only venture capital. We also have large businesses and major investors who are looking for particular product lines and innovations. The study we're performing now is not just on commercialization. We're looking at the whole aspect of the problems that have to do with commercialization. We're looking at patents, marketing, venture capital, financing license arrangements. We are looking at every aspect of the process.

One of the points that we have noted so far in the study is that small business, high-technology firms actually use venture capital far less than people would imagine. They tend more to go into joint agreements and they're tending to license more and they're tending to work out their own financing. There is an opinion within the country, among these people, that this occurs because venture capitalists generally want too much. The companies do not want to give up that much ownership.

Mr. ROWE. Thank you, Mr. Chairman.

Chairman SKELTON. Mr. Rhodes.

Mr. RHODES. When the process leads to phase III, to the commercial application, does the United States retain any sort of proprietary interest in the product or the process that's being developed?

Mr. SHANE. Congressman, we retain a royalty-free license in each and every one of the SBIR projects. We allow the company the national and international patent rights.

Mr. RHODES. Do most of these projects that move into phase III result in a patentable right?

Mr. SHANE. Many of them do. This is what we're studying now. It's kind of a misnomer and I don't want to mislead the committee. It's an extensive study that we're doing. We're looking at all these different areas. That's one of the areas we are looking at.

We feel our study is unique, because we're not mailing out a questionnaire. We have a phone method, where we have people highly trained speaking to the companies. We follow through on each question. If a person says they're having a patent problem, we follow through to try and find out what it is. Or if they're having a financing problem, why is it you're having this problem, as opposed to just checking a box and you never really know the depth of the problem.

This is why I was hesitant to give full information, because we still have it in the computer trying to run out the final details on what is actually occurring.

Mr. RHODES. But basically, the Government does receive royalties or licensing fees?

Mr. SHANE. We receive a royalty-free license in the product.

Mr. RHODES. Thank you, Mr. Chairman.

Chairman SKELTON. Touchdown is phase III. Being American, I am result-oriented. We, of course, in the days ahead, will revisit with you, Mr. Shane and Mr. Sweeney, as to the success rates of phase III, as well as phases I and II. I am deeply concerned that maybe some of these recipients are pretty good at the application process.

I would be interested in possibly having you look at these lists of the recipients for 1989, the top 20, and the recipients for 1986 through 1989, and tell me how many of those SBIR awards in those top 20 went into phase III. If you could do that, we will leave the record open for 30 days and you can supply that information and it will become a part of this hearing.

Chairman SKELTON. Mr. Machtley, did you have a question, sir?

Mr. MACHTLEY. I'll pass for now.

Chairman SKELTON. Mr. Hefley, do you have a question?

Mr. HEFLEY. No, Mr. Chairman.

Chairman SKELTON. I'm out of questions. I think you understand what we're interested in. I appreciate your responding to our request.

Though we have asked some tough questions, it looks like you have a successful program; there's far more positive than there is negative. But being a congressional hearing, you also realize that we probably dwell more on the negative aspects than on the positive. Still, it looks like you're doing a lot of good things. I wish to compliment you for that. We will look forward to another hearing at a later date. Still, if you would get that information for us, it would be much appreciated.

If there is no further comment or questions, I thank Mr. Shane and Mr. Sweeney.

Mr. SHANE. Thank you.

Mr. SWEENEY. Thank you, Mr. Chairman.

Chairman SKELTON. The hearing is adjourned.

[Whereupon, at 1:43 p.m., the subcommittee was adjourned, subject to the call of the Chair.]

APPENDIX

IKE SKELTON, MISSOURI
CHAIRMAN

SILVIO O. CONTE, MASSACHUSETTS
RANKING MINORITY MEMBER

RUSSELL ORBAN
STAFF DIRECTOR-COUNSEL
202-225-9368

WILLIAM J. ANGELO
MINORITY PROFESSIONAL
STAFF MEMBER
202-226-3420

101st Congress

United States House of Representatives
Committee on Small Business
Subcommittee on Procurement, Tourism, and
Rural Development
B-363 Rayburn House Office Building
Washington, DC 20515

OPENING STATEMENT OF
CHAIRMAN IKE SKELTON

HEARING ON THE
SMALL BUSINESS INNOVATION RESEARCH (SBIR) PROGRAM

OCTOBER 17, 1990

This hearing will now come to order. Today the Small Business Subcommittee on Procurement is conducting an oversight hearing on the Small Business Innovation Research (SBIR) Program. In the process, we also wish to examine the operation of the Small Business Administration's Office of Innovation, Research, and Technology, the office responsible for implementing and monitoring the SBIR Program.

Representing the Small Business Administration (SBA) we are pleased to have with us Mr. Richard Shane, Assistant Administrator of the SBA's Office of Innovation, Research, and Technology. Accompanying Mr. Shane is Deputy Administrator Jack Sweeney. I would like to thank them both for their assistance to the subcommittee.

Established by the Small Business Innovation Development Act of 1982 (P.L. 97-219), which I was pleased to cosponsor, the SBIR Program requires all agencies with yearly external research obligations of more than $100 million to solicit research proposals from small businesses and provide funds for qualified projects. Participating agencies must set aside at least 1.25 percent from research and development budgets for the SBIR Program. Of course this is a floor -- I am pleased that some agencies exceed those levels and work very hard to solicit, review, and select outstanding projects. In another life I also serve as a member of the Armed Services Committee, and I am delighted to see the Department of Defense lead the way in this program.

The goals of the program were set by Congress as follows: to stimulate technological innovation; to use small businesses to meet federal research and development needs; to foster and encourage participation by minority and disadvantaged persons in technological innovation; and to increase private sector

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commercialization innovations derived from federal research and development. Though there was some resistance to the act from agencies, the program received widespread support, it was recommended by the President's Commission on Innovation, it was recommended by the first White House Conference on Small Business, and finally was cosponsored by 90 senators and over 200 congressmen.

The SBIR Program was enthusiastically received when it was first implemented in FY 1983. Indeed, the program had earned so much support from the small business community that delegates at the second White House Conference on Small Business convinced the Congress to take a look at early reauthorization of the program. This reauthorization was achieved in 1986, 2 years before the program was originally set to expire.

Some of the reasons for the popularity of the program are obvious. Small businesses, especially small high-tech businesses, have been shown to be cost-effective performers of research and development. I believe that studies in 1970 showed small businesses to be 24 times more productive than large businesses with the R & D dollar and 4 times more productive than medium-sized businesses. Small businesses without access to sufficient funds for independent research and development have certainly been helped through the SBIR Program because they have a chance to prove themselves and flesh out their research.

But a further goal of the program, and one that is latched on to by legislators, is that the program should increase the commercialization of federal research and development. Research comes out of the federal bureaucracy and is developed and applied by the private sector. This definitely gives us a bigger bang for our federal research buck -- and small, innovative companies benefit in the marketplace by applying this research. The country benefits because federal research (half of all research funds available in the U.S.) is finally put to use. It is our ability to apply what we have learned that will be the mark of a successful effort to compete in the fast-paced world markets.

But it is not our intent to have this hearing be simply a recapitulation of the successes of the SBIR program. Our witnesses have come to report to Congress of their progress with this program and to bring us up to date on the status and preliminary findings of their research and record keeping with regard to the program. Is the SBIR program meeting the goals set our by Congress?

There are some aspects of the SBIR program which raise some concern. For one thing the high concentration of awards geographically leads to the suggestion that more should be done to teach other parts of the country how to apply for awards as successfully.

Also, I have some questions about the growing number of

companies which seem to have made a full time enterprise out of winning multiple SBIR awards. I am including in the record a list of the top 20 award winners for 1989. Amazingly these 20 companies account for fully 11% of all awards during that period. When you consider that the SBA has 70,000 names of small businesses interested in the SBIR program and 19,000 proposals were received in 1989, this top heavy tendency merits further discussion. Are we channeling federal research and development money to the most promising scientific researchers or to the most talented application drafters?

Further, we need to reflect on whether Congress intended a program where individual companies can win 20, 30, or even 40 awards per year, and 50, 100, or 150 awards over 4 years. How are we really doing in Phase III, the commercialization component of the program? Conceivably, if a small business is winning a good number of awards and proceeding to successful commercialization of their innovations, this small business could quickly become a big business. Congressional intent did not sanction the creation "SBIR award factories" in the small business community. We want to make sure that a growing number of small businesses benefits from entry into the area of technological innovation.

In addition, proposals have been made over the years to change the program. For example, how early does the Congress need to reauthorize the program in order to avoid disruption of SBIR at the agency level? Other proposals to reform the program that we want to look at include suggestions to increase agency SBIR set-aside percentages, to make the program permanent, to authorize funds for SBIR administration costs, and to lower the research and development budget threshold to increase the number of participating agencies.

With our hearing today, we start our consideration of all these issues. Over the next year, this subcommittee intends to talk to a representative group of participants, program managers and aspirants in anticipation of the reports on the program by GAO and SBA at the end of next year. We should be able to build a solid case for reauthorization of this program on the foundation that these hearings will provide.

We look forward to Mr. Shane's remarks on the program, on the SBA's annual SBIR report, and his preliminary statement on the commercialization report being prepared by the Office of Innovation, Research, and Technology.

Do any Members have opening statements?

Top Recipients of SBIR Awards in 1989

	## of grants	
Foster-Miller Inc. Waltham, MA	38	$5,876,169
Spire Corporation Bedford, MA	31	2,847,306
EIC Norwood, MA	21	2,869,235
Sparta Inc. Torrance, CA	21	4,032,010
Physical Optics Corp. Torrance, CA	21	2,777,763
Advanced Tech Materials New Milford, CT	16	1,006,614
Creare Inc. Hanover, NH	15	4,370,849
Physical Sciences Inc. Andover, MA	14	1,768,699
Advance Decision Systems Mountain View, CA	14	3,491,045
Geo-Centers Newton Centre, MA	13	1,629,627
Bio-Metric Aystems Inc. Eden Prairie, MN	13	1,609,587
Scientific Research Assoc Glastonbury, CT	13	1,627,715
Radiation Monitoring Devices Watertown, MA	12	1,667,919
Science Research Lab Inc. Somerville, MA	12	1,918,932
Ultramet Pacoima, CA	11	2,563,190
Aeorodyne Billerica, CA	11	1,537,783
Flow Research Kent, WA	11	2,182,091

Triangle Research & Development Corp Resch Triangle Pk, NC	10	999,955
Cape Cod Research Buzzards Bay, MA	9	1,080,006
Bend Research Inc. Bend, OR	9	813,491
Totals	315	$46,669,986
Total Awards Granted in 1989	2,886	$432,000,000
Top Twenty Firms Percent of 1989 grants	11%	11%

Selected Multiple Award Winners from FY1986 to FY1989

Foster-Miller, Inc.	153	20,006,426
Spire Corp.	96	9,880,521
Sparta Inc.	77	10,738,405
Creare, Inc.	75	13,719,610
Flow Research Co	69	9,149,629
EIC	61	9,397,170
Physical Sciences, Inc.	59	8,438,394
Scientific Research Association	54	8,042,747
PDA Engineering	49	4,023,022
Aerodyne Research	45	5,211,857
Bend Research Inc.	45	6,342,707
Geo-Centers, Inc.	43	4,165,802
Radiation Monitoring Devices	43	5,843,444
Physical Optics Corp.	40	5,971,373
Bio-Metric Systems Inc.	39	4,224,256
Ultramet	38	6,241,199
Advanced Decision Systems	37	5,819,555
Technical Research Assoc	37	3,201,885
Odetics	33	6,934,048
Decision Science Consortium	32	4,464,528
Totals	1125	$151.4 million

SILVIO O. CONTE
FIRST DISTRICT, MASSACHUSETTS

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Remarks of the
Honorable Silvio O. Conte
Hearing on the SBIR program
October 17, 1990

Thank you, Mr. Chairman. I have always been a strong advocate of the Small Business Innovation Research program. I was proud to be an original cosponsor of both its enabling legislation in 1981 and the reauthorization bill in 1986. The SBIR program makes sure that small businesses, the major innovators in our economy, receive their fair share of Federal research and development funds. The program faced a fair amount of opposition at the beginning. Over the years, however, it has become known, both at home and abroad, as an excellent source of new ideas, technology, products, and jobs.

The SBIR program is now approaching its 1993 sunset. I am grateful to you, Mr. Chairman, for calling this hearing so we may make preparations for the reauthorization of the SBIR program and any changes that might be proposed for it. This early action is critical. SBIR is a three-phase program and it needs this kind of lead time to ensure its continuity and stability.

I look forward to the testimony of the witnesses and hearing about the progress the SBIR program has made towards its goals. I should also like, at this time, to introduce for the record several letters I have received from small business persons who have participated in the SBIR program and would like to express their support for it.

CHARLES EVANS & ASSOCIATES
SPECIALISTS IN MATERIALS CHARACTERIZATION

October 12, 1990

The Honorable Silvio Conte
Small Business Committee
United States House of Representatives
Rayburn Office Building, Suite 2426
Washington, DC 20515

Dear Mr. Conte:

It is our understanding that the small business committee is engaged in hearings concerning reauthorization of the Small Business Innovation Research (SBIR) program. For the past nine years our company has participated in the program with a number of different federal agencies. In this letter I would like to share with you some of our SBIR experiences. In particular I would like to tell you how the program has contributed to the development of our business from a two person service company in 1978 to a vital growing concern of 120 employees and three operating divisions today.

CHARLES EVANS & ASSOCIATES was founded by Dr. Charles A. Evans Jr. and myself in September, 1978, as a private materials analysis laboratory specializing in a technique called secondary ion mass spectrometry (SIMS). Total capitalization of the company consisted of $80,000 (nominally our combined net worths) and a collateralized bank loan of about $375,000 with which we purchased the first-of-its-kind-in-the-U.S. SIMS instrument from a French manufacturer. Our business plan entailed selling materials analysis services (using this instrument) to clients from various segments of the high technology community, including industry, government laboratories and academia. The most immediate applications were envisioned to be in semiconductor materials, metallurgy, geology, and biomaterials. Within six months of inception the company was at a break-even point and after one year had five full-time employees. Sales that first year were slightly less than $300,000. By the end of the second year we had added a second French SIMS instrument (then priced at around $450,000) and a Japanese Auger electron spectrometer. By the end of the second year the staff had grown to twelve and the company continued to be marginally profitable. Sales were in the neighborhood of $1,000,000. It was at this point that we first became involved with SBIR.

Prior to forming CHARLES EVANS & ASSOCIATES, Dr. Evans and I had worked together in the Materials Research Laboratory (MRL) at the University of Illinois, Urbana-Champaign. Dr. Evans was the group leader of the central chemical analysis facility and I worked for him as a staff materials analyst. During our six years at the U of I, in addition to pursuing the basic research programs of the laboratory, we also engaged in our own research projects externally sponsored by various federal agencies. Thus we were experienced in

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conducting scientific research and were versed in the preparation of competitive research proposals. As we had no shortage of research ideas in late 1980, SBIR was a natural research funding vehicle for us to explore. The only remaining question was how to mold the fundamental SBIR objective of research commercialization into the framework of our service laboratory to the benefit of both our business and the supporting agency.

The first opportunity arose in early 1981. The French SIMS instrument possessed incredible imaging capabilities (ion microscope), but no provisions with which to exploit those capabilities; for example, taking quantitative two dimensional "pictures" of the chemistry within an integrated circuit. The instrument was equipped with an ordinary 35 mm photographic camera, but that approach was woefully inadequate. What was needed was an electronic imaging detector that could acquire and transmit sample images to a computer for storage and data processing. If such a device could be perfected, it would have tremendous impact in terms of expanding the types and sophistication of analyses performed. However, the French manufacturer was seemingly disinterested in pursuing the research needed to develop the requisite detector. Neither did they seem to have any ideas as to how to approach the problem. CHARLES EVANS & ASSOCIATES did.

We were aware of a neighboring small business called Surface Science Laboratories (SSL) in Mountain View, California, that had developed and patented a very sensitive position-sensitive electron detector for use in their electron spectrometry instruments. In principle, the device appeared to be appropriate for our purposes. However, there remained a key research question, namely: "would the SSL detector perform in our SIMS instruments for the detection of secondary ion images?" It was an ideal SBIR Phase I feasibility study which happened to topically coincide with the 1981 SBIR solicitation from the National Science Foundation. A proposal was submitted and subsequently funded in the amount of $25,000 in May 1981. This sum would not cover the purchase of a detector from SSL, nor could CHARLES EVANS & ASSOCIATES afford to buy one at that time. Thus, the actual Phase I experiments were conducted in collaboration with SSL who allowed us to borrow their demonstrator for the critical Phase I experiments. These experiments proved to be highly successful although the feasibility apparatus was rather primitive.

While feasibility was clearly demonstrated during Phase I, there remained many important research questions as well as hardware/software developments needed in order to make the detector a viable prototype product. These issues were all addressed in a Phase II research proposal which was subsequently approved and funded in the amount $139,661 during the period between May, 1983 and April 1985. The intervening period between early 1982 and mid-1983 reflected the time delay between the end of Phase I and the beginning of Phase II funding. During that time the project was dormant and the participating researchers were necessarily supported by other commercial activities within the company.

Ultimately, the Phase II research was just as successful as Phase I had been earlier. In fact, shortly after the end of Phase II, the prototype detector (purchased and modified for the project out of corporate funds) was sold to Toshiba in Japan - our first sale. Since then we have developed a computer data system for use in conjunction with the detector, as well as a number of smaller derivative accessory products. Over the past five years, cumulative sales of this product have reached $8,675,000, 60% of which have been exports to Japan, Korea and Western Europe. A number of units have been installed in the U. S. at places like the T. J. Watson Research Center (IBM), AT&T Bell Laboratories, the National Institute for Standards and Technology, University of Illinois, Sandia National Laboratory and Lawrence Livermore National Laboratory. Besides Toshiba, we have sold units in Japan to companies like Nippon Steel, Matsushita Technoresearch, Sony and Toray Research Center. Systems have been sold to the Energy Technology Research Institute of Korea, the Institute for Research in Science and Technology of Italy, IBM Germany, the French Telecommunications Research Center (CNET), Edinburgh University in Scotland, and the Royal Signals and Radar Establishment in England. Additional sales of this product during FY 1991 are anticipated to be between $1,500,000 and $2,000,000, at least half of which should be exports. If these latter sales results are achieved, cumulative sales will exceed $10,000,000 over six years, all predicated on a combined NSF SBIR Phase I and Phase II "investment" of $165,000 between 1981 and 1985.

Although somewhat less spectacular, a second NSF sponsored research program entitled "Surface Microanalysis of Ion Implanted Steels" has also led to a new product, namely ion implanted reference materials for secondary ion mass spectrometry. A $30,000 Phase I feasibility research project was funded between February and July, 1984. A follow-on Phase II program was funded in the amount $199,352 for the period between February, 1986 and July, 1988. The ensuing product was actually conceived during the course of the Phase II research and not originally anticipated in the proposal per se. Since the end of this Phase II, sales of reference materials have totalled $420,000. About 80% of these sales have been exports, mainly to Japan. Future sales of $200,000 per year for the next several years appear very likely.

I should point out that the emergence of the imaging detector/data system developed under NSF SBIR support transformed our predominantly analytical service business into a more diversified company including product manufacturing. In 1988, the existence of an in-house engineering, product development and sales organization led to our developing a totally unrelated product, a charged particle scattering chamber and data system for attachment to existing energetic ion beam accelerators. This product did not receive direct SBIR support, but was the beneficiary of a corporate infrastructure that grew out of earlier SBIR product commercialization activities. Two scattering chambers were sold in 1989, both exports (Belgium and Japan), with a combined sales price of about $380,000. Seven additional units were delivered in FY 1990, two domestic and five exports (four Japan and one Korea), generating sales of approximately $1,318,000.

Total company sales during FY 1990, ended August 24, 1990, reached a new record high of $11,800,000. Product sales in FY 1990 were $3,583,000 or roughly 30% of the total. It is fair to say that had it not been for the SBIR program, we would not be in the scientific instrument manufacturing business today. Moreover, it is doubtful that we would have experienced the growth we have achieved in the core analytical service business as well, because of the obvious synergies between the two activities. While we have consistently relied on internal Phase III commercialization funding, we estimate that nearly $2,000,000 of corporate funds have been employed for this purpose during the past five years. Other internal "investments" are currently being made into various non-SBIR related technologies with the funds generated by profits from earlier SBIR successes. Growth is geometric.

Our company continues to conceive and explore innovative new ideas through the SBIR program. At the present time we have two ongoing Phase II projects from the National Institutes of Health, two from the Department of Energy, one from the National Aeronautics and Space Administration, one from the National Science Foundation and one from the Defense Advanced Research Projects Agency. The technologies represented span an almost incomprehensible range, from a search for the existence of biogenic carbon in pristine interplanetary dust to the development of a methodology for detecting toxic and essential trace elements in microscopic quantities of physiological fluids. In between, we are endeavoring to develop: 1) a new instrument which we call the Quantum Microscope for direct imaging of the indigenous visible light emission from polymers and plastics related to degradation mechanisms; 2) an electron beam electroreflectance spectrometer for probing the electronic band structure of compound semiconductors used in solid state lasers and detectors, night vision detectors and supercomputer chips; and 3) uniquely configured position-sensitive ion detectors for monitoring energetic particle beams with potential uses in the National accelerator laboratories for boron-10 neutron capture radiation cancer therapy or proton beam tomography.

Finally, I would be remiss if I did not comment on the importance of SBIR to our company's ability to attract, retain and motivate the best scientific talent in the United States today. A recent human resource audit revealed that of our nearly 120 employees, 35 are Ph.D.'s, 7 M.S.'s, 31 B.A.'s or B.S.'s and 11 A.A.'s. Many of our Ph.D.'s were educated at the most prestigious academic institutions in the country, including CalTech, MIT, UC Berkeley, Cornell, Stanford, University of Illinois, Michigan State, Penn State, Brown, University of Houston, Rice, Yale and UCLA. Six are foreign nationals having come to us by way of the University of Surrey and the University of Sheffield in the UK, the University of Munster and Johann Wolfgang Goethe University in West Germany, the Warsaw University of Poland and the University of Pisa in Italy. In terms of academic disciplines represented among our most senior professional staff, 17 are chemists, 11 physicists, 4 geologists, 3 geochemists, 2 materials scientists, 1 geophysicist, 1 pharmacologist, 1 electrical engineer, 1 mechanical engineer, and 1 metallurgist. Clearly we have a highly educated group of workers (and I mean that term literally) for whom the opportunity to conduct meaningful research and publish in the open scientific literature is extremely important

and makes their career experience at CHARLES EVANS & ASSOCIATES more appealing and rewarding. SBIR has helped make those professional growth opportunities available to our staff.

The success of CHARLES EVANS & ASSOCIATES in California has recently spawned the creation of new affiliated laboratories in Princeton, New Jersey; Minneapolis, Minnesota; and London, England. Sales offices are being created in Stamford, Connecticut; Denver, Colorado; Hong Kong; Tokyo, Japan; and elsewhere around the world. Our ultimate goal is to become an international force in the scientific community in both materials analysis services and scientific instrumentation. SBIR is helping us achieve that goal.

In conclusion, I cannot overstate the critically important role SBIR has played in the evolution and growth of our company. The 32% increase in sales and 50% increase in number of employees recorded during the past twelve months undoubtedly would not have occurred without our SBIR support. While our experience may appear impressive, I doubt that we are unique. Furthermore, you are now seeing only the most recent snapshot in our long term corporate history. If present trends continue, it is unlikely that we will remain a "small business" much longer. But when the time comes that we surpass the small business size limitation, there no doubt will be countless other embryonic CHARLES EVANS & ASSOCIATES' poised to take our place on the SBIR landscape, provided the program still exists. We at CHARLES EVANS & ASSOCIATES certainly hope that will prove to be the case.

Sincerely,

Richard J. Blattner
Vice President &
Chief Financial Officer

sjk

cc: The Honorable John LaFalce

TSI
TECHNOLOGY SYSTEMS INC.

October 15, 1990

The Honorable Silvio Conte
House of Representatives
2300 Rayburn House
Washington, D.C. 20515

Sir:

This letter is sent in support of the Small Business Research Innovation program (SBIR) and the need for prompt legislation addressing the reauthorization beyond the present sunset provision of 1993.

From a business standpoint, an SBIR project typically involves a 3 year commitment. In essence, failure to address the SBIR sunset provisions within the next year could result in funds not being available to support new SBIR efforts for a full Phase 1 & Phase 2 term. This is a critical issue which must be resolved if we, as a nation, are to continue to reap the significant benefits of this program.

Technology Systems is a typical SBIR active small business. Our involvement in SBIR has resulted in:

- Rapid advancement in state-of-the-art computing technology,
- The creation of meaningful jobs,
- Access to prime contract and subcontract opportunities not otherwise possible, and
- The development of applicable technology which will *save the U.S. government millions of dollars.*

The following abbreviated history of Technology Systems demonstrates the critical impact which SBIR has made upon our business potential, and how this has influenced the technical capabilities of the industry in which we work.

Originally formed in 1981 as part of the emerging personal computing industry, the firm's initial successes were found in the creation of video games and related software for the consumer electronics and entertainment industry. In 1987 the Defense Advanced

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Research Projects Agency (DARPA) placed a topic in that year's SBIR solicitation titled "Application of Arcade Level Technology to Simulation and Training". Technology Systems successfully proposed a Phase 1 project based upon use of its core technology (video game software). This project is now in the final stages of Phase 2 and has spawned a number of Phase 3 applications.

Specifically, through the use of the SBIR program, we have developed a computing system which sells for less than $50,000 that replaces current systems costing in excess of $250,000. Over the last 5 years, the Department of Defense (DOD) has purchased over 200 simulation systems for the SIMNET program, which is an expenditure of over $50 million dollars. Due to the changing military environment, simulation is becoming a cost effective component in training and mission rehearsal. Future DOD acquisitions in this area are currently projected to include over 1000 simulation systems, which at $250,000 each represents a quarter billion dollars. Our SBIR funded efforts have resulted in the development of low cost technology which will potentially **save taxpayers over $200 million dollars**. The cost of this SBIR project to date? **Under $380,000!**

In another SBIR project currently underway with the USAF Human Resources Laboratory, we have been able to bring together a key DOD laboratory, internationally known human factors scientists, and our in-house team of low cost technology experts to produce a revolutionary new system which will provide critical high quality data to the research community. Again, the cost of has been significantly less than from alternative sources.

We also have been involved in advanced research relating to cockpit displays. This a critical area of technology in which US technical superiority must be maintained. Our efforts in this area are multi-disciplinary and provide a high-quality, low-cost means of providing our nation a technical edge. Again, this effort has been a direct result of the SBIR program. Unfortunately, the current limitations on SBIR funds and the emerging uncertainty about SBIR's funding future has resulted in our Phase 2 efforts in this area currently being put on hold. This latter condition is an increasingly serious problem.

In the context of the current budgetary strains, the SBIR program provides a rare opportunity to produce high quality results at very low costs. It is unfortunate that not enough funding is available to allow all the R&D which should be performed to actually be funded. *It would be a disgrace to allow the cost effective and high quality efforts created by the SBIR program to be discontinued through inaction on Congress' behalf.*

There are several qualities that are common to not only our SBIR efforts but to most all SBIR projects. These are:

- The competitive nature of the program results in the consistent identification and funding of top quality projects.
- The small businesses which participate produce results often in a shorter time frame than their large business counterparts.
- Dollar for dollar, small businesses typically incur lower overhead costs than their large business counterparts -- this is a bargain for the government.
- The SBIR program's structure provides an excellent means to put together multi-disciplinary, highly focused, highly skilled teams to quickly develop solutions to pressing technical issues.

In essence, certainly in the fields of endeavor in which Technology Systems functions, the government gets technology faster, better and cheaper through the use of SBIR. Our own SBIR funded efforts will have long-term, far-reaching effects. As a direct result of our SBIR work, we are discussing subcontract work with Boeing, Ford Aerospace, IBM, Martin Marietta, SwRI, and a number of other prime contractors to the government. We also are actively selling systems to the commercial aviation industry. The SBIR program, through Technology Systems, has produced a rapid reduction of simulation and computing technology costs. This is reducing the government's costs, advancing the nation's technological edge, and spurring national economic growth.

I urge prompt legislative action to promote and maintain the stability of this critical and proven program.

Sincerely,
TECHNOLOGY SYSTEMS, INC.

Charles Benton
President

cc: Sen. William Cohen
Sen. George Mitchell
Rep. Joseph E. Brennen
Rep. Olympia Snowe

Modell
Development
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October 16, 1990

Representative Silvio O. Conte
United States Congress
2300 Rayburn House Office Building
Washington, DC 20510

Dear Representative Conte:

I am writing to express my support of the Small Business Innovative Research Program (SBIR). If the opportunity arises, I would be pleased if you would enter my comments into the Congressional Record.

I am a Chemical Engineer who has been working in the environmental area since the late 1960's - long before it was fashionable. I was a Professor of Chemical Engineering at M.I.T. from 1964 through 1980. I made some discoveries in 1975 which led to the invention of a new process for destroying wastes, including hazardous materials. The process is called Supercritical Water Oxidation (SCWO). A number of applications are in the research, development and demonstration phase at the present time. These include destruction of solid rocket propellants, destruction of chemical warfare agents, treatment of mixed radioactive wastes, and treatment of municipal and industrial sludges. In addition to my own organization, Modell Development Corporation (MODEC), the technology is under investigation at the Livermore Labs of the Sandia National Lab, M.I.T., the University of Texas at Austin, the University of Illinois at Urbana-Champaign, and the University of Michigan at Ann Arbor.

In 1980, I took a leave of absence from M.I.T. to start a company, Modar, Inc., to develop the supercritical water oxidation technology for hazardous waste applications. Had the SBIR program been in existence then, it would have been a superb vehicle upon which to embark on development of the SCWO technology. Instead, Modar sought development funding from private sources. We entered into a development project with a firm whose primary business was landfilling hazardous waste. This firm claimed to be looking for new methods to destroy wastes rather than burying them. They used their investment in the SCWO project to avoid building incinerators and to extend their permits for landfilling. Several years later, after Modar had made substantial progress, this firm did all it could to retard further progress. Modar was subsequently financed by venture capitalists who knew very little about the waste treatment business. They took control of the company and relieved me of my

duties in 1985. They thought that the technology was ready to commercialize and that further development was not necessary.

Over the past five years, Modar still has not commercialized a single unit. The worldwide rights to my inventions that were assigned to Modar are now in the hands of a European corporation.

In 1987, I returned to the task of developing the supercritical water oxidation technology and formed my present company, Modell Development Corporation. I made a number of SBIR proposals in 1987 and 1988. Three were selected by the DoD and one by the NSF. Three of these were funded for Phase I projects. We have now completed two (one for DARPA on destruction of chemical warfare agents and one for the Air Force on destruction of solid rocket propellants).

During the past two years, we have been able to solve the remaining technical problems that have hindered the commercial application of this technology. We are now under contract to the Department of Energy (Office of Industrial Technology) to apply our new process to the recovery of energy from treatment of pulp mill sludges. The DOE will join with several firms in the pulp and paper industry to sponsor a demonstration of the technology at a pilot unit scale.

Although our DOE project itself is not an SBIR program, our SBIR awards over the past several years were instrumental in helping us build our capabilities while maintaining control of our own destiny. We have been able to build a modest asset base on my resources, with help from some family and friends, the traditional American way. While the SBIR program is far from perfect, I view it as an important element in providing support for what Americans probably do better than any other nation on Earth: innovate. I would encourage you to continue to support the SBIR program.

Sincerely,

M. Modell II

Michael Modell
President
Modell Development Corporation

cc: Representative Chester G. Atkins
Representative Joseph P. Kennedy
Senator John F. Kerry
Senator Edward M. Kennedy
Ann Eskesen, Innovative Development Institute

OPENING STATEMENT OF HON. RONALD K. MACHTLEY

I would like to commend the Chairman for holding this hearing at a critical time for small businesses throughout America.

This hearing has a particular importance for New England, where the combination between a sluggish economy and a credit crunch have hit the Northeast with a fury.

Mr. Chairman, as you are aware, the Small Business Innovation Research Program (or SBIR program) was created by Congress in 1982 to stimulate technological innovation; to encourage small science, human service and technology firms to participate in governmental research; and to provide incentives for the transfer of research results into commercial applications. Only small, for-profit businesses of under 500 employees are eligible to compete for SBIR funding.

The Federal SBIR program works by requring federal agencies with R&D budgets of over $100 million or more to parcel out a protion of their research to small businesses throughout the country. For example, the Department of Defense might advertise it is seeking a company to develop new fire retardant fabrics. Once a research department writes a winning proposal, then the agency would provide funding. This program, coordinated by the SBA made available over $415 million in 1989 for diverse projects.

A little over two years ago, the State of Rhode Island approved a Rhode Island SBIR program to piggyback the federal program. This program has been very successful in drawing attention to the federal SBIR program and its benefits, and has also provided important encouragements to small companies interested in the federal program.

Under the State SBIR program, the Rhode Island Partnership for Science and Technology will give grants ranging from $1,000 to $25,000 to any Rhode Island firm that submits a qualified research and development proposal to the federal government. These funds help to assist Rhode Island firms in winning their fair share of federal dollars.

So far in 1990, over 40 one thousand dollar grants have been given to companies applying for Phase I grants. In 1988, nine Rhode Island companies won SBIR grants totaling more than one million dollars from the federal government.

The State of Rhode Island has argued strongly in favor of the SBIR program, emphasizing that applying for these awards is not only painless, but financially rewarding because the State of Rhode Island will help to underwrite the cost of preparing an application.

It seems to me that the SBIR program provides a strong example of the potential for collaboration between the federal government and the states. This is especially necessary for fostering the kind of innovation and technological development needed in America's small firms.

The stagnation of the small manufacturing firms in America could portend an overall loss of innovative capacity in manufacturing and jobs for our economy, and a further weakening of the U.S. competitive position. Efforts like the SBIR program attempt to get at the bottom line: putting more federal R&D dollars into small businesses -- which in reality, have created most of the innovation and jobs in this country over the past two decades.

I look forward to hearing the testimony on this program, and methods which we may improve our efforts to strengthen competitiveness for our small firms.

4.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, D.C. 20416

TESTIMONY OF

RICHARD SHANE

ASSISTANT ADMINISTRATOR OFFICE

OF INNOVATION, RESEARCH AND TECHNOLOGY

BEFORE THE COMMITTEE ON SMALL BUSINESS

SUBCOMMITTEE ON PROCUREMENT, TOURISM AND

RURAL DEVELOPMENT OF THE U.S.

HOUSE OF REPRESENTATIVES ON THE

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

OCTOBER 17, 1990

Mr. Chairman and members of the subcommittee, it is my pleasure to testify before you today concerning the Small Business Innovation Research Program. I am accompanied today by Mr. Jack Sweeney, Deputy Assistant Administrator of our Office of Innovation, Research and Technology.

I. Program Overview

The Small Business Innovation Research (SBIR) Program continues to show solid evidence that it is fulfilling its central objectives: To spur development of new products and processes by small hi-tech enterprises and then to bring an increasing number of those new products and processes to the commercial marketplace-and in the process foster and encourage technical innovation by minority and disadvantaged persons.

The SBIR Program began in Fiscal Year 1983. In its seven years, SBIR can list these highlights and accomplishments:

- In response to 90 solicitations, the 11 federal agencies participating in the Program have received 95,800 proposals from small hi-tech firms, resulting in 14,903 competitive awards worth more than $1.8 billion.

- In Fiscal Year 1989, 2,886 awards were made, worth $431.9 million.

- More than 70,000 names and addresses of small firms have been recorded on SBIR's fully automated outreach system mailing list, and thus receive current information on SBIR programs and policies and useful information on agency solicitation for proposals.

- Most importantly, an increasing number of small hi-tech companies receiving SBIR awards are achieving commercial sales success. These successes have come in a wide range of technologies-everything from medical science, fisheries and solid waste management to aerospace, computers, electronics and life science. Our ongoing SBIR commercialization study, in preliminary findings, shows that about one in four small hi-tech firms receiving SBIR awards has achieved commercial sales success or has good reason to expect that commercialization will be realized in the near future.

Thus, the SBIR Program is turning research and development results into new products and processes which help keep America competitive and benefit virtually all of our citizens-and even people abroad.

II. Programmatic Background

Congress in 1982 enacted the Small Business Innovation Development Act (Public Law 97-219) with the realization that small businesses-especially small hi-tech businesses-are cost-effective performers of research and development and are particularly capable of turning research and development into new and helpful products and processes.

The statute, which created the Small Business Innovation Research (SBIR) Program, strengthened the role of small, innovative enterprises in federally-funded research and development as a strong base for technological innovation.

The President signed the Small Business Innovation Development Act on July 22, 1982. The Act originally was to expire on October 1, 1988, but during Fiscal Year 1986, Congress enacted legislation extending the law through September 30, 1993 (PL 99-443). The President signed the extension legislation on October 6, 1986.

In passing the 1982 Act, Congress said it found that technological innovation creates jobs, increases productivity, competition and economic growth, and is a valuable counter force to inflation and the United States balance of payment deficit.

Congress also said that while small business is the nation's principal source of significant innovations, the vast majority of federally funded research and development had been conducted by large businesses, universities and government laboratories.

Based upon these findings, Congress described four purposes of the Act:

1. To stimulate technological innovation.

2. To use small businesses to meet federal research and development needs.

3. To foster and encourage participation by minority and disadvantaged persons in technological innovation.

4. To increase private sector commercialization innovations derived from federal research and development.

Under the SBIR Program, each federal agency with an extramural budget for research and research and development in excess of $100 million for Fiscal Year 1982, or any fiscal year thereafter, must establish an SBIR Program. The program is funded by setting aside a set percentage of the participating agency's extramural research or research and development contracting dollars during

each fiscal year. The mandated set aside is 1.25 percent.

There are 11 participating federal SBIR agencies.

Department of Agriculture
Department of Commerce
Department of Defense
Department of Education
Department of Energy
Department of Health and Human Services
Department of Transportation
Environmental Protection Agency
National Aeronautics & Space Administration
National Science Foundation
Nuclear Regulatory Commission

The SBIR Program is a three phase process.

Phase I: Phase I awards average $50,000 and are made for research projects to evaluate the scientific and technical merit and feasibility of an idea.

Phase II: Phase I projects with the most potential are funded to further develop the proposed idea for one or two years. Most Phase II awards are funded for $500,000 or less.

Phase III: An innovation is brought to market by private sector investment and support. No SBIR funds may be used in Phase III. When appropriate, Phase III may involve follow-on production contracts with a federal agency for future use by the Federal Government.

The law designated SBA as the agency for program implementation, government policy and monitoring and analysis. The SBA's authorities and responsibilities are:

1. Developing, coordinating, issuing and updating a Policy Directive for the Federal Government-wide conduct of the SBIR Program.

2. Developing and administering an SBIR Program information and outreach program.

3. Developing and maintaining a mailing list file of interested small business concerns.

4. Developing, coordinating, publishing and disseminating SBIR Pre-Solicitation Announcements.

5. Surveying, monitoring and reporting on agency SBIR Programs.

6. Reporting at least annually to Congress on SBA monitoring activities.

7. Private sector coordination on the commercialization aspects of SBIR innovations.

SBA, in carrying out its responsibility, wants to make sure that all interested small businesses are provided with current program and solicitation information and opportunities available in the SBIR Program. Toward this end, SBA has developed a mailing list of those individuals and small firms that have requested to be included. This list was converted to a fully computerized process six years ago.

In Fiscal Year 1989, SBA continued to improve and expand this system. The present fully automated system is highly accurate and features rapid updating and purge proficiencies.

As required by law, the SBIR solicitation process minimizes regulatory burdens and mandates timely receipt and review of proposals, peer review, propriety information guidelines, selection of awardees, data rights retention, title to government property, cost sharing and cost principles.

SBA's SBIR Pre-Solicitation Announcements to small businesses present basic program solicitation information in a succinct and

understandable manner. Each publication provides complete information on all quarterly SBIR activity and eliminates the need for small businesses to track the activities of each participating agency.

SBIR Pre-Solicitation Announcements are published and distributed prior to the time of agency solicitations. The announcements provide small businesses with a brief statement of each agency research topic, the opening and closing dates of each solicitation, an estimate of the number of awards to be made under each solicitation, who to contact for a copy of the agency solicitation and a master schedule of agency opening and closing dates.

The response from the public to these Pre-Solicitation Announcement has been excellent.

During Fiscal Year 1989, SBA published four SBIR Pre-Solicitation Announcements. For the seven years of the program, over 1,800,000 announcements have been distributed.

During Fiscal Year 1989, SBA cooperated with numerous organizations that conducted SBIR seminars and conferences. This cooperation included providing information, materials and speakers. SBA field representatives and public and private organizations have become a more significant part of the

information dissemination process.

SBA continues to publish a special SBIR Program pamphlet which in addition to providing program information also serves as a mechanism for mailing list development. SBA field offices have been furnished a supply of the pamphlets and will continue to be a primary source of outreach. In order to meet the demand for speakers throughout the country, SBA utilized an audio/visual program which presents a detailed explanation of the SBIR Program. The audio/visual program is available on video tape.

Another form of outreach used by SBA are briefings to officials of foreign governments. During Fiscal Year 1989, foreign interest in the SBIR Program grew even stronger and SBA's staff briefed 21 foreign government officials. SBIR-type programs are in place in Europe and the United Kingdom.

A major goal of the SBIR Program is to bring research and development results to the marketplace.

The SBIR Program therefore not only encourages more research and development, but it also encourages commercialization by offering the possibility of economic reward for innovations successfully marketed by SBIR firms.

Recognizing that most small firms with innovative products have

difficulty finding the financing required for the final development, manufacture, and marketing of their product, SBA has developed a Commercialization Matching System. The system maintains data on all SBIR awardees including the company name and address, principal investigator, and information about the innovation to be commercialized. The system also includes information on financing sources that have requested inclusion and will provide information on the type of investment opportunities they are seeking.

From this data base, the Commercialization Matching System provides technical abstracts of SBIR projects to possible investors, and provides SBIR awardees with information on sources of capital that might consider investing in their innovations. Matching selections from the data base are made on the basis of technology and industry preferences, geographic preferences, and dollar thresholds. Over 10,000 SBIR projects and 450 capital sources are currently listed in the data base.

In order to provide accurate information to SBIR awardees, the data on sources of capital were updated in Fiscal Year 1989. Capital sources that no longer have an interest in investing in SBIR companies were deleted.

III. Fiscal Year 1989 Data

During Fiscal Year 1989, the 11 participating SBIR agencies awarded $431.9 million through the SBIR Program; the total represented a 11% increase over the approximately $389 million obligated in Fiscal Year 1988. Phase I awards were worth $108 million in Fiscal Year 1989; Phase II awards totaled $322 million. The overall award dollar total includes $2.5 million in modifications to non-1989 awards.

Twelve Phase I SBIR solicitations were released by the 11 participating agencies in Fiscal Year 1989; HHS released two solicitations; the other 10 agencies released one.

As a result of the solicitations, 17,233 Phase I proposals were received from small businesses.

A total of 2,137 Phase I awards were made in Fiscal Year 1989. Phase I awards represented 12% of proposals received.

During Fiscal Year 1989, a total of 1,776 Phase II proposals were received and resulted in 749 new awards. The Fiscal Year 1989 awards represented 42% of all Phase II proposals received.

Minority/disadvantaged-owned firms received 242 Phase I awards in Fiscal Year 1989, worth $12.3 million, and 77 Phase II awards

worth $28.5 million. The $40.8 million worth of Fiscal Year 1989 awards to minority/disadvantaged firms represented 9.4% of all SBIR dollars. Since the program's inception, minority/disadvantaged-owned firms have received 1,666 awards, representing 11.2% of all SBIR awards; the value of these awards totaled $178 million, representing 9.8% of all dollars awarded.

Since the SBIR Program's start, over $1.8 billion has been awarded to small businesses; $178 million was awarded to minority/disadvantaged-owned small businesses.

Each participating agency will continue to award at least the mandated of 1.25% as required by law. Therefore, unless agency R&D budgets significantly increase or decrease, total SBIR dollars obligated in the future are estimated to remain at about the present level.

A total of 11,366 Phase I and 3,537 Phase II awards have been made since the program's beginning. The agencies received 87,299 Phase I proposals and 7,501 Phase II proposals responding to 90 SBIR solicitations. Several participating agencies have allocated more for this program than is required by law. Awards have been made to firms in the 50 states, Puerto Rico and the District of Columbia. The SBIR Program continues to receive national acclaim and international recognition for quality performance.

IV. National Outreach

To provide the public with detailed information on all SBIR awarded research, arrangements were made with the National Technical Information Service of the Department of Commerce to publish information on SBIR awards in the service's nationwide computerized data base. This data base includes information on the awardees, awarding agency, funding, and technical abstracts of the awardees' work. The data are available to the public, including other researchers and businesses through the terminals of the nation-wide FEDREP system.

During Fiscal Year 1990, efforts were completed to construct a closer relationship with our state SBIR counterparts,. SBA's Office of Innovation, Research and Technology has establish a liaison where possible in every state. Additionally, a handbook was compiled and published to assist interested small businesses in becoming aware of the various programs and support that are available in the states. This handbook was provided to our total mailing list.

To increase dissemination of SBIR information to new and expanded markets, various technology transfer mechanisms were put into being by SBA's Office of Innovation Research and Technology. For example, the Naval Air Development Center at Warminster, PA, in cooperation with the Federal Laboratory Consortium, is

establishing a pilot program to provide computer owners access to new, emerging federal technologies by computer modem, over a telephone "Gateway" system. During Fiscal Year 1990, direct access to SBIR research topics were provided as part of the system. Thus personal computer users can instantaneously access SBIR technical topics currently of interest to participating SBIR Agencies.

To support our SBA Regional and state efforts, the Office of Innovation Research and Technology provided speakers and support to 25 SBIR seminars during the year. During the same period we briefed 21 foreign visitors concerning the program.

V. Program Review and Audit

The Small Business Innovation Research program has been the subject of more review and audit than any R&D program in the Federal Government. Since program inception in Fiscal Year 1983, we have had six General Accounting Office audits and reports and another has just begun. The Office of Science and Technology Policy has issued six reports and the Office of Innovation, Research and Technology has provided Congress with seven detailed annual reports. In addition the SBA is conducting a commercialization study.

Surveys done by SBA over the last three years show that the SBIR

Program is well on the way to fulfilling its basic objective: To turn research and development by SBIR awardees into commercial success. These firms operate in a wide variety of industries, and are outstanding examples of how SBIR funding significantly helped in the firms' R&D and in the firms' efforts to bring their products and services to the commercial market.

The SBA surveys indicate that one in four firms reports successful commercial marketing four years after completing Phase II. Even after only two years since completing Phase II, 13 percent of the firms surveyed reported successful commercialization.

This figure rose to 22 percent among firms surveyed three years after Phase II completion, and then to the 25 percent figure after four years.

SBA has now surveyed more than 800 Phase II projects. In the first year of the surveys, SBA attempted to contact all Phase II awardees who had won Phase I awards in the first full year of the program (Fiscal Year 1983). This contact resulted in 353 firms being surveyed, a 90 percent response rate. In the following two years, samples of 240 projects (representing about half of all Phase II awards for that period) were surveyed.

The amount of commercialization varies with each federal agency.

Using survey results among firms reporting commercialization success three years after completion of their Phase II research and development, the Department of Health and Human Services shows the greatest commercialization success rate by far-36 percent. Figures for other agencies are National Science Foundation, 20 percent; Department of Energy, 19 percent; NASA, 19 percent, and Department of Defense, 13 percent. The other agencies did not have enough Phase II projects to produce meaningful statistics.

It is our intent to publish our findings and analysis during calendar year 1991.

As noted before, the General Accounting Office has just begun their latest legislated audit which is due to Congress in December of 1991.

Upon the completion and publication of both of these documents the SBA will be in a position to make recommendations concerning any proposed changes to the law during reauthorization hearings.

VI. Summary

Based upon our experience and data collected and reviewed to date, we are very optimistic as to the program's accomplishments and potential. The participating agencies and small high technology businesses deserve a great amount of credit for the current success of the Small Business Innovation Research Program. I am confident that the two forthcoming reports will provide us with the positive information that we anticipate.

I will be pleased to answer any questions you may have.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, D.C. 20416

NOV 2 1990

Honorable Ike Skelton
House of Representatives
Washington, DC 20515

Dear Congressman Skelton:

This is in response to the inquiry raised at the Committee's hearing on the Small Business Innovation Research program, October 17, 1990. The concern was expressed that certain SBIR firms that had won multiple awards were focusing more on the process of preparing winning proposals for R & D work than commercializing the product or service resulting from their participation in the program.

A review of projects recently awarded is constrained by the fact that from the time that a firm is awarded a Phase I contract or grant until the completion of its Phase II work a period of three years has elapsed. We have also found that from the completion of Phase II until meaningful commercialization is initiated, typically another two to three years passes. Thus a firm winning an award this year is not likely to experience successful commercialization until 1994 or 1995.

Thus, if we are to attempt to determine if there is significant difference in commercialization between those that have recently won few SBIR awards versus those that have won several, we must depend on an examination of the trends and experiences of those multiple award winning firms in their earlier years of program participation. The study is based then, not on the awards a multiple award winning firm received recently, but those awards it won several years ago. Among the uncertainties of this approach is that the multiple award winning firm this year might not have existed several years ago or that the experience from then will not be replicated in awards made this year.

Still, this approach should provide indication of the performance and attitudes existing in multiple award winning firms as compared in general to firms that were awarded few, or perhaps only one award. The findings are based on specialized data found in our ongoing study of commercialization efforts in the SBIR program and on our on-site visits and interviews with the management of many SBIR firms.

Our on site review of firms and their management included a significant number of firms that were multiple award winners. The results of these visits and discussions on multiple award firms were reported in our annual report to the Congress (Fourth Year Results) and concluded that firms with multiple awards appeared to be just as committed to the successful performance and commercialization of SBIR projects as companies that had won only one or a few awards.

At the present time, we have quantitative data on commercialization based on telephone surveys conducted during the past three years. The survey sample consists of 834 Phase 2 SBIR projects awarded during fiscal years 1984 to 1986. In order to track commercialization progress over time, a sample of the projects surveyed in the first year were re-surveyed in the subsequent two survey years. A sample of the projects surveyed in the second year were re-surveyed in the third survey year. To address the issue of multiple award winners, SBIR projects from all three survey years were grouped together. For those projects surveyed more than once, the determination of commercialization is based on the most recent survey.

Within this group, we examined companies with at least 6 projects. These companies represent 11 percent of all projects in the survey - the same percentage identified as "top recipients of SBIR awards" in 1989. Of these projects, our survey indicates that 16.8 percent have had success in commercializing SBIR results. We do not consider this to be significantly different from the 18.2 percent commercialization rate for all of the projects in the survey. Based upon this data and our interviews, we do not consider the multiple award issue as a serious technical or quality problem at this time. Please be assured that we will continue to review and monitor the multiple award process.

Please note that these data should be considered preliminary in that our data analysis effort is still ongoing. Also these results are likely to change in time as more surveys are conducted.

Sincerely,

RJJ Shane

Richard J. Shane
Assistant Administrator
Office of Innovation
Research and Technology